



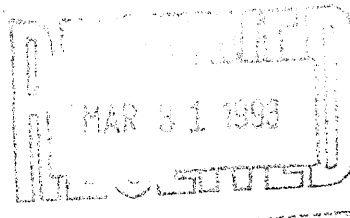
Commonwealth of Massachusetts
Executive Office of Environmental Affairs

Department of Environmental Protection

Central Regional Office

William F. Weld
Governor

Daniel S. Greenbaum
Commissioner



TO: Helen Waldorf, Section Chief
Federal Facilities

THRU: Mary Gardner, Section Chief *MG*
Technical Support

FROM: Don Hanson, MSCA Coordinator, *Don* Technical Support

DATE: March 25, 1993

SUBJECT: MSCA Site Inspection Prioritization (SIP) Report
James River Inc. Mill No. 8
Route 31, Old Princeton Road
Fitchburg, MA

MAD065777344

Attached, please find the Site Investigation Prioritization (SIP) addendum report to the February 6, 1991 Site Inspection report prepared by the NUS Corporation for James River Inc. Mill No. 8. This addendum is to be submitted to the U.S. Environmental Protection Agency (U.S. EPA) for completion of the MSCA grant task. This addendum is designed to satisfy the requirements requested by the U.S. EPA for completion of a SIP under MSCA grant tasks. This addendum includes a cover memo, narrative and the Hazard Ranking Score (HRS) package.

SUMMARY & RECOMMENDATIONS

Mill # 8 manufactured paper from 1840 to June 1, 1990 when the plant closed. The James River Corporation owned the facility from 1975. On August 17, 1990, James River announced the signing of a letter of intent with a New York Investment group to sell the facility (NUS 1991). As of March 5, 1993, the mill has not been sold.

From 1969 to 1971, the Weyerhaeuser Co. disposed of non-chlorinated petroleum-based liquids and a toluene-based sludge contained in 1,327 - 55 gallon drums in two trenches on-site. The sludge was from the coating operation used by James River Inc. Mill No. 10 (MAD075365650). The drums containing the sludge had been transported to Mill No. 8 and buried there.

TO: Mary Gardner, Section Chief *MLG*
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The Site Inspection Prioritization (SIP) report presents the findings of research and a review of the files at the Department of Environmental Protection (DEP), Central Regional Office (CRO) in Worcester, Massachusetts. This report meets the requirements of the United States Environmental Protection Agency (U.S. EPA) SIP criteria for completion of the MSCA grant task.

SITE DESCRIPTION

Name, Location, and Size

Please refer to NUS Corp. 1991. Final Screening Site Inspection. Page 1, Figure 1 and Figure 2. Figure 2 is the site plan prepared by the NUS Corp. for the 1991 report. Within the SIP, however, Figure 2 is referred to as Figure 3. The locations of the two sludge dewatering lagoons are contained in this map. Figure 1 in the SIP is a site location map prepared by DEP/CRO/MSCA (USGS 1988). The size of the lagoons is presented on page 2.

Property Use

Please refer to NUS Corp. 1991. Final Screening Site Inspection. Pages 1, 3 and Figure 2.

In addition, DEP/MSCA/CRO found the following description in the Malcolm Pirnie report, pages 1-2 and 1-3 (1979).

"The No. 8 paper mill (James River - Mass.) is located west of Princeton Road and immediately east of Snows Mill Pond from which it receives its process water supply. The mill property consists of over 150 acres of land and pond area including all of Snows Mill Pond and the water rights to the Whitman River.

On-site work at Mill #8 included the removal of 1,327 drums, their contents, and contaminated soil in August, 1980. All contaminated materials were shipped to various secure landfills around the country. On July 11, 1990, NUS/FIT conducted a surface soil sampling round at the location of the former trenches that contained the drums. Information concerning this sampling round and other Site Investigation requirements are contained in the NUS report.

NUS, however, was not granted access to sample two former surface impoundments on-site. The SIP will review available information on these impoundments. NUS reported that paper sludge was disposed of in these surface impoundments from 1980 - 1984. Research by DEP/MSCA has revealed that disposal of paper sludge to the lagoons occurred from the mid-1960s through 1984. In addition, analytical results indicate groundwater and surface water contamination. Also, wastewater was disposed of in the lagoons and into the neighboring wetland until 1978. After 1984, paper sludge from the papermaking operation was sent to the City of Fitchburg's Wastewater Treatment Plant for processing.

NUS Corporation, under contract with the US EPA, prepared a Site Investigation (SI) report. The SI was accepted by the U.S. EPA on February 25, 1991. In accordance with the requirements for a Site Investigation Prioritization (SIP) as outlined by the U.S. EPA, the SIP will review those studies prepared after the date of the Site Investigation. Information contained within the SI will be referenced throughout this document. In addition, this SIP will review information on the sludge landfills.

The Department of Environmental Protection/Central Regional Office recommends that the U.S. EPA conduct an Expanded Site Investigation focusing in four areas. First, a literature review of the papermaking operations and on-site disposal practices. Second, the extent of groundwater contamination associated with this site. Third, the extent of contamination in the neighboring surface water and related sediments. Fourth, the extent of soil contamination on-site and off-site. Fifth, an assessment of the potential threat to nearby private wells. These results and an updated HRS will determine if further investigation and assessment is required under CERCLA.

Based upon a measure specific gravity of 1.01 and 30 percent solids content in the dried cake, the dry weight density of solids in the sludge cake is 18.9 lbs. per cu. ft. At a solids flows rate of 5,200 lbs. per day, the rate of sludge cake build-up in the lagoons is 10.2 cu. yds. per day or about 3,680 cu. yds. in 12 months. This amounts to approximately a 40 inch layer (at 30% solids) over the lagoon bottom.

Initially, water associated with phase separation of the sludge in the dewatering lagoons has no difficulty in percolating through the sludge and sand bottom. However, as a function of time and sludge build-up, the permeability of the bottom layers gradually is reduced which slows the drying process.

Starting in February 1979, James River determined that the total sludge flow to the lagoons could be reduced from 125,000 gpd to 35,000 gpd by increasing the underflow solids concentration from the pretreatment clarifier. This achieved an immediate reduction in water content of the sludge by 72 percent."

If 3,680 cu. yd. of sludge were deposited per year, then over the 12 year history of sludge disposal (1965 - 1978) in the lagoon, approximately 44,160 cu. yds. (12 years X 3,680 cu. yd.) of sludge were deposited. Page 9 of this report illustrates the reasoning behind 12 year duration.

Also, Malcolm Pirnie, Inc. (1979) presented the following historical information on the deposition of residual wastes in the sludge disposal area.

"The sludge disposal site area has been used for many years as a dump for several mills in the area, and has received various types of construction debris, demolition materials, general fill, ashes, and other wastes in addition to sludge from the lagoons.

While no record of these materials is available, it is known that substantial quantities of scrap metal, including old reinforcing bars, structural steel scrap, drums, miscellaneous machinery parts, and piping are buried on the site. Concrete pipe sections, wood, and miscellaneous debris are in evidence along the dump site slopes. It is also known that, as part of the construction of the West Fitchburg Wastewater Treatment Plant, upwards of 200,000 cu. yds. of sludge was excavated from the former Flagg Brook stream bottom (the present West Plant site) and hauled to the James River property, then owned by the Weyerhaeuser Co.

The quantity, locations, and extent of historic dumping is not presently known since most of these wastes have been covered over for years." For a visual depiction of the extent of sludge accumulation based upon boring logs, please refer to Figures 3 through 6 as prepared by Malcolm Pirnie, Inc. (1979).

Physical Characteristics

Please refer to NUS Corp. 1991. Final Screening Site Inspection. Pages 1, 4 and 5.

Malcolm Pirnie, Inc. (1979) offered the following description of the site geology and site hydrology.

"The James River - Massachusetts Paper Mill and its sludge dewatering lagoons are situated on what is interpreted to be a glacial lake delta deposit.

The sludge dewatering lagoons are superimposed on the Whitman/North Nashua valley fill aquifer system. The regional ground water flow is from west to east. Estimates of hydraulic conductivity for the regional system are on the order of 1 to 50 ft/day, with ground water gradients from about 0.01 to 0.02 ft/ft. Ground water velocities for this system are interpreted to be 0.01 ft/day to 1.00 ft./day.

The deltaic deposits penetrated by the borings were highly variable sands (fine silty sand to fine-coarse sand) with measured/estimated hydraulic conductivities on the order of 1 to 100 ft/day. A value of 5 ft/day was assumed to be an average hydraulic conductivity for the site. Based on observations in the monitoring wells, groundwater gradients within the deposits averaged about 0.05 ft/ft to the south and 0.1 ft/ft to the west. The gradients to north and east could not be defined due to lack of water level information, but were assumed to be more gentle. The discharging of approximately 24 gpm into the sludge dewatering lagoons creates a mini-local ground water mound superimposed on the pre-existing mound created by the deltaic deposits. Because of the coarseness of the upper surficial deposits, this mini-mound dissipates quickly into the mound created by normal precipitation. Ground water velocities leaving the lagoon area were assumed to be on the order of .25 to .50 ft/day.

A water balance has been determined for the area including and immediately adjacent to the sludge lagoons (critical effective area of approximately 350,000 ft squared. The components of this water budget are precipitation, evapotranspiration, infiltration, runoff, deep percolation, lagoon seepage, and evaporation from the lagoons."

It was estimated that approximately 4,300,000 gallons per year become ground water from the available precipitation. Leachate from the lagoons, at the present rate of sludge discharge, adds approximately 12,300,000 gallons to the ground each year. DEP/MSCA estimates that 147,600,000 gallons of leachate were disposed of over the 12 year life-span of the lagoons. See page 9 for the reasoning behind the 12 year life-span.

Seepage has been observed near the base of the old sludge deposits (shown on Plate IV). Based on the water balance, as much as three-fourths of the observed seepage could be attributed to the drainage from the sludge dewatering lagoons. Of course, it is possible that groundwater from a larger area is contributing flow to this point which would result in a low percentage of contribution from the sludge lagoons.

Source Areas

Please refer to NUS Corp. 1991. Final Screening Site Inspection. Pages 2 and 3; Figure 2.

NUS reported the analytical results of surface soil samples. Results indicated the presence of fly ash residuals, ie., pyrene, fluorene, benzo(a)pyrene, anthracene, and chrysene. On May 26, 1981 and April 27, 1981, the Department (Desmond 1981) and the City of Fitchburg, (Coulter 1981) respectively, gave permission for James River to dispose of ash resulting from on-site coal burning in old on-site land-fills which had been used for trash and ash disposal prior to the 1940's. Given the description of materials found in the pits excavated for removal of the 1,327 drums, ie building materials, it is possible that the removal of the drums and subsequent refilling of the pits with on-site soils caused the coal ash to be brought to the surface. Consequently, NUS may have sampled these land-fills as a result of conducting surface soil sampling.

On November 16, 1978, Mr. John Hackler (1978) of Water Compliance with the U.S. EPA prepared a memo to file concerning the unauthorized discharge of papermill waste from the lagoons at James River Mass. Co. The memo reported that an inspector from the EPA had observed a front-end loader mucking out one dewatered lagoon and pushing about a 2-3 foot wall of paper sludge over the side of the lagoon where it fell down the embankment. In addition, a pump pumped a milky-white liquid out of the other lagoon into a swampy area. The inspector learned from the operator of the front-end loader that the pump ran 7 1/2 to 8 hrs/day. He determined that the pump pumped about 150,000 gpd. The white water exited via a brook and into Sawmill Pond (See Figure 2 in SIP). The inspector noted that there was a sediment build-up in Sawmill Pond. James River did not have a discharge permit at the time. The inspector estimated the dimensions of the sludge pile at about 50' high X 200' wide X 20-30' thick at the base and tapering to 3-4' at the top.

On November 20, 1978, Richard Leighton (1978), Sanitary Engineer with the U. S. EPA prepared a report to John Hackler of the Water Compliance Section of the EPA concerning the November 11, 1978 site inspection. Mr. Leighton described the collection of 6 surface water samples (Figure 2) along the path of the waste stream to Sawmill Pond. Results "showed large amounts of wood fibers entering the natural stream". Unfortunately, present interpretation of most of the analytical results is not possible. Visual examination of the stream banks showed large sludge deposits. White streaks on the stream banks were seen well into Sawmill Pond. Mr. Leighton stated that the white streaks probably are titanium dioxide. Analytical results revealed titanium dioxide to be present in the following amounts:

Station	Ti (ug/l)	Station	Ti (ug/l)
JRP001	12,000	JRP004	9,500
JRP002	K 350	JRP005	K 350
JRP003	28,500	JRP006	K 350

K = Actual value is known to be less than value given.

The toxicity of titanium dioxide was reviewed by Clement Associates, Inc. (1985), for the U.S. EPA. Research revealed that the available data were not adequate to characterize the toxicity of titanium to wildlife and domestic animals. Titanium dioxide is reported to have tumorigenic effects at the site of intramuscular injection in rats. Results of a 2-year feeding study conducted for the National Cancer Institute indicated that titanium dioxide was not carcinogenic in rats and mice under the conditions of the bioassay.

Mr. Leighton concluded that "the discharge from the sludge ponds had been going on for some time in order to build up such large deposits of sludge down through Sawmill Pond. Extensive work would need to be done in order to quantify the amount of sludge that has been deposited along the way to Sawmill Pond".

On Nov. 30, 1978, Peter Dore (1978) of the MA. Dept. of Water Pollution Control stated that the "waste disposal procedures utilized by the company is both inadequate and illegal because it causes pollution of the receiving stream and was done without an NPDES permit (Division and EPA) without a subsurface disposal permit (Division) and with a sludge disposal permit (DEQE)."

On December 1, 1978, a letter from Mr. Neal Martin (1978) of the James River - Massachusetts, Inc. to Mr. John Hackler, Sanitary Engineer with the U.S. EPA, James River agreed to no dumping of dewatered sludge over the embankment and no discharge of supernatant from the lagoons. Therefore, DEP/MSCA assumes that the discharge via pumps and by the dumping of sludge over the embankment of the lagoons ended on December 1, 1978.

Under Docket No. 79-739, the U.S. EPA (1979) found that James River Massachusetts, Inc. had violated Section 301 of the Federal Clean Water Act 33 U.S.C. 1311 by discharging pollutants without a permit (NPDES) and were in violation of established effluent limitations for such pollutants. A pump was observed to discharge liquid into a swampy area nearby which eventually flowed to a brook which joined a larger brook leading to Sawmill Pond, a navigable water of the United States (See Figure 2). A front-end loader was also observed removing accumulated sludge from a second lagoon and depositing the sludge on the adjacent embankment. Samples taken of the discharged waste revealed wood fibers and other substances normally associated with paper mill waste. Such material is a pollutant as defined in 33 U.S.C. 1362. Further investigation by EPA personnel revealed that the two lagoons were being used by James River Massachusetts, Inc., for sludge disposal. Sludge from the paper mill's primary clarifier was being pumped to the second lagoon while supernatant from the first was being discharged at a rate of approximately 150,000 gallons per day. As the first lagoon became de-watered, the front-end loader would remove the sludge by pushing it over the embankment of the lagoon. Once the sludge was removed, the pumping sequence was switched and the second lagoon was similarly dewatered and the sludge removed. The observed amount of sludge piled around the two lagoons, made it apparent that the waste disposal procedure had been utilized by James River Massachusetts Inc., for a long period of time.

Malcolm Pirnie, Inc. was hired by James River to assist in the compliance requirements outlined in the Superior Court Department Judgement. All sampling for the study of the sludge lagoons was done by Malcolm Pirnie, Inc. personnel and analysis performed at the Malcolm Pirnie, Inc. laboratory in White Plains, NY.

During the course of the study, several samples of water seeping from the lower slopes of the sludge lagoon area were taken for analysis. Samples were also taken in the drainage stream which carries surface waters to a culvert at the edge of the James River Property (See Tables 3 & 4).

These surface water samples are representative of waters which have drained down from the dewatering lagoons and/or are the result of percolation through older fill deposits on the site. Evaluation of these data indicates that all parameters are low, with the exception of iron. All other metals were present in low concentrations.

DEP/MSCA would like to point out, however, that the usual QA/QC controls were probably not in place and the detection limit or holding times are unknown. Also, the only contaminants that were searched for were the metals and tetrahydrofuran and dimethylformamide. Therefore, it is highly probable that additional contaminants were present but not detected.

In addition, 5 borings were made between March 27 and April 5, 1979 by Soil Exploration Corporation of Stow, MA. The following two paragraphs details the 5 borings as described in Malcolm Pirnie 1979.

"In general, boring penetrated 60 feet of sand and gravel, which was sampled every 5 feet with a 2 inch O.D. split spoon sampler driven with a 140 hammer. Open holes were maintained with a 2 3/4 inch O.D. casing which was cleaned by means of a chopping bit. Observation wells developed for boring B-1, B-2 and B-3 consisted of 1 1/2 inch Schedule 80 PVC pipe. The wells consisted of 20 feet of factory slotted pipe which was sand-wicked during installation. Borings B-4 and B-5 were augered-out to receive 4 inch diameter Schedule 40 PVC pipe wells, also with 20 feet of factory slotted pipe. The 4 inch piping was set in B-4 and B-5 with the expectation that these locations would be best for long-term monitoring.

Two additional observation wells were placed at the edge of the wetlands adjacent to the Boston and Maine railroad. These wells were installed utilizing a backhoe and were constructed of 6 inch diameter stainless steel pipe, 12 feet in length. Four feet of the pipe was drilled with 3/8-inch diameter holes and wrapped with filter fabric. In both installations, approximately 6 feet of straight pipe were left above the ground surface. See Figure 3 & 4 for sampling results.

According to the Judgement of the Superior Court of Massachusetts, State and federal authorities reached an out-of-court settlement. James River paid a civil penalty of \$97,000 and an agreement to present a plan to the EPA to prevent a future occurrence (Commonwealth of Mass. 1979).

The following information about the dewatering lagoons was obtained in a letter and attached Environmental Notification Form (ENF) of August 6, 1984 from Mr. Norman E. Burt of James River - Massachusetts, Inc. to Mrs. Ruth Mayor of the Fitchburg Conservation Commission (Burt 1984).

The 1.5 acre lagoons had been in operation since the mid-1960's. For the purpose of this report, DEP/MSCA will assume a start date of January 1, 1965. The lagoons were closed in February 1985 according to a letter from Mr. Norman Burt of James River - Massachusetts to Mr. David Shepardson (1985) of the MEPA Unit. The lagoons, however, were operational from approximately January 1, 1965 to December 1, 1978 or for 12 years.

The waste water from the paper mill was pumped to a 66 ft diameter clarifier which removed about 80% of the solids prior to discharge to the West Fitchburg Waste Water Treatment Plant. The solids that were removed in the clarifier were pumped at about 2% consistency to the dewatering lagoons. About 30,000 gallons per day of paper mill sludge were pumped to the lagoons. When a lagoon had been in operation for about 14 months, the flow was directed to the second lagoon. The first lagoon was allowed to dry for 6 months before the dried solids were excavated. The ENF stated that the lagoons discharged to the groundwater approximately 21 gpm of water. In 1984, it was estimated that the system would generate about 3 tons/day annually of paper mill sludge. The sludge solids consisted of approximately 30% clay and 70% paper sludge. The ENF revealed the following analysis of the aqueous phase of the discharge from the lagoons:

BOD5 = 20000-100000 ug/l; NH3-N = 2800-5300 ug/l; Tot.-P = 260-450 ug/l; Fe = 160 - 1880 ug/l; Cd = 0-50 ug/l; Cu = 0-80 ug/l; Zn = 0-160 ug/l; Ba = 0-300 ug/l; Hg = .21-130 ug/l.

On January 16, 1980, the DEP issued a permit (July 1980) to allow James River - Massachusetts to continue to discharge in the two existing lagoons. Included with the conditions for operation were the installation of five test wells and that sampling will be done monthly commencing in April 1980. Also, surface water monitoring for pH, iron, TOC, BOD, COD, THF, and DMF (See Tables 1 and 2). The flow to the lagoons could not exceed 50,000 gallons/day.

On October 5, 1984, a internal DEP memo from Clint Watson (1984) to Paul Hogan relayed the following information.

James River Paper Company, Fitchburg, has applied for a groundwater discharge permit for their two unlined lagoons in which they dispose of (dewater) paper sludge. Effluent from the lagoons appear to be percolating to groundwater and breaking out at the bottom of a hill into wetland. Conditions in the immediate area of the wetland are noxious - the vegetation is black, odors are prevalent, water is discolored, foam is present, etc. The memo requested sampling of the effluent and wetlands in the area. Suggested sample parameters included COD, sulfite, specific conductance, Ph, phenol, chloroform, xylene, zinc, lead, cadmium, iron, chromium, and mercury. Please refer to Tables 1 & 2 in this report for copies of analytical records from the various wells and sampling locations on-site.

On August 23, 1984, a "Certificate of the Secretary of Environmental Affairs on Environmental Notification Form" related how "the two sludge lagoons on the high ground of the James River property appears to be the cause of breakouts of foul smelling water in the lowlands (wetlands) adjacent to the site (Hoyte 1984). See Table 1 for a review of groundwater analysis.

As a follow-up to a September 19th, 1984 site visit, an internal DEP memo prepared on October 26, 1984 from Jessica Lacy to Stan Szczurko et al., (Lacy 1984) resulted from a October 25, 1984 site visit to the dewatering lagoons. The memo described the overall conditions as "even worse" than the site visit of September 19, 1984 as far as odor and discoloration was concerned. New information presented was that underneath the pool (DEP/MSCA assumes that the "pool" was at the base of the sludge pile) and at least part of the marsh lies an estimated 3 inches of paper sludge covered by sand. These 3 inches of paper sludge was believed to result from the backhoe work in 1978, Also, the extent of the area of discoloration and odor was greater than was observed on September 19, 1984.

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On February 14, 1985, Norman Burt (1985) of James River sent to Dave Shepardson, Associate Environmentalist with the Executive Office of Environmental Affairs (EOEA) a letter which indicated that the lagoons were not in operation and will be closed. On March 13, 1985, Mr. Thomas McMahon, (1985) Director of the DWPC, modified the interim status letter of September 5, 1984. The principal modification was to continue to monitor the groundwater until January 1, 1986.

SITE ACTIVITY/HISTORY

Ownership/History

Please refer to NUS Corp. 1991. Final Screening Site Inspection. Page 2.

According to Malcolm Pirnie, Inc. (1979), Mill # 8 "is the largest of several mills in West Fitchburg which were built and operated by Crocker Burbank Co. starting in 1826. These mills were sold to the Weyerhaeuser Co. in the mid 1960's." This statement made by Malcolm Pirnie is not clear if Mill # 8 started in 1826 or if the chain of mills started in 1826. Given that this was the 8th mill, most likely the statement in the SI by NUS (1991) that the mill started in 1840 is accurate.

Inspections, Permits, Studies

Please refer to NUS Corp. 1991. Final Screening Site Inspection. Page 2, 3, 4

According to information obtained from the Division of Water Pollution Control/CERO, the lagoons are still undergoing closure proceedings with a group within the EPA. No additional information is available at this time.

Analytical Data

Please refer to NUS Corp. 1991. Final Screening Site Inspection. Pages 6 and 7; Table 4 and Table 5

There are no analytical data previous to or subsequent to the NUS report of 1991 for the former barrel dump.

Water Supplies

Please refer to NUS Corp. 1991. Final Screening Site Inspection. Pages 4, 5. The information presented in the NUS report has two basic problems. First, the population figures result from 1980 data, not 1990 data. Second, the various population parameters requested by the U.S. EPA are not broken down by distance rings from the site, ie., 1/4, 1/2, 1.0, 2.0, 3.0 and 4.0 mile. Therefore, in addition to the information presented by NUS, the DEP also included the required updated and revised information in Figure 4 and 5, and Table 3. According to the NUS report and a review of the reference: Division of Water Supply. 1991. Public Water Supply Inventory 1991. Division of Water Supply., there are no public groundwater supply sources within 4 miles of the site. Also, there are no public surface water supplies along the 15-mile downstream distance from the site. The Wachusett Reservoir, however, is approximately 16.5 miles from the site (Please refer to: NUS Corp. 1991. Final Screening Site Inspection. Page 5).

Figure 2 and 2A depict the probable surface water pathway to Sawmill Pond from the former lagoons. Figure 2 represents the pathway as shown by the EPA inspector in 1978. Figure 2A represents the surface water pathway from the lagoons on the Flood Insurance Rate Map (1983) as interpreted from Figure 2. Figure 2A also shows that the site (the lagoons and the drum disposal area) are in Zone C or an area of minimal flooding as defined by the Federal Emergency Management Agency. Figure 2 indicates that the waste stream from the lagoons to Wyman Pond Brook (see Figure 2A) would probably be defined as an intermittently-flowing stream by CERCLIS. A perennially-flowing stream probably starts where the intermittent stream meets Wyman Pond Brook. For the purposes of the SIP, DEP/MSCA understands that the perennial-flowing stream starts at where the waste stream entered Wyman Pond Brook. Also, based upon Figure 2A, DEP/MSCA estimates the distance from the sludge lagoons to Wyman Pond Brook to be 1,200 feet.

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SUMMARY & RECOMMENDATIONS

Mill # 8 operated as a paper mill from 1840 - 1990. Currently, the mill is shut-down and for sale. From approximately 1965 - 1979, the paper mill sludge was dumped ;into 2 lagoons on-site. Paper sludge was also dumped over the edge of the lagoons into a wetland. It is estimated that 44,160 cu. yds. of sludge was released by James River from 1965 - 1979. Also, the lagoons and surrounding area was used as a general dump of construction debris, ash, demolition materials, drums, and upwards to 200,000 cubic yards of sludge from the Flagg Brook stream area. Therefore, the potential exists for approximately 244,160 cu. yds. of sludge to have been deposited on-site. Available analytical data indicates that contamination was present in the ground and surface water.

The Department of Environmental Protection/Central Regional Office recommends that the U.S. EPA conduct a Expanded Site Investigation focusing in five areas. First, a literature review of the papermaking operations and on-site disposal practices. Second, the extent of groundwater contamination associated with this site. Third, the extent of contamination in the neighboring surface water and related sediments. Fourth, the extent of soil contamination on-site and off-site. Fifth, an assessment of the potential threat to nearby private wells. These results and an updated HRS will determine if further investigation and assessment is required under CERCLA.

In addition, MSCA/CRO requests that EPA/CERCLIS locate the section within EPA Region 1 that is working with James River on the closure of the lagoons. MSCA/CRO also requests that EPA/CERCLIS inform MSCA/CRO as to the status of the closure.

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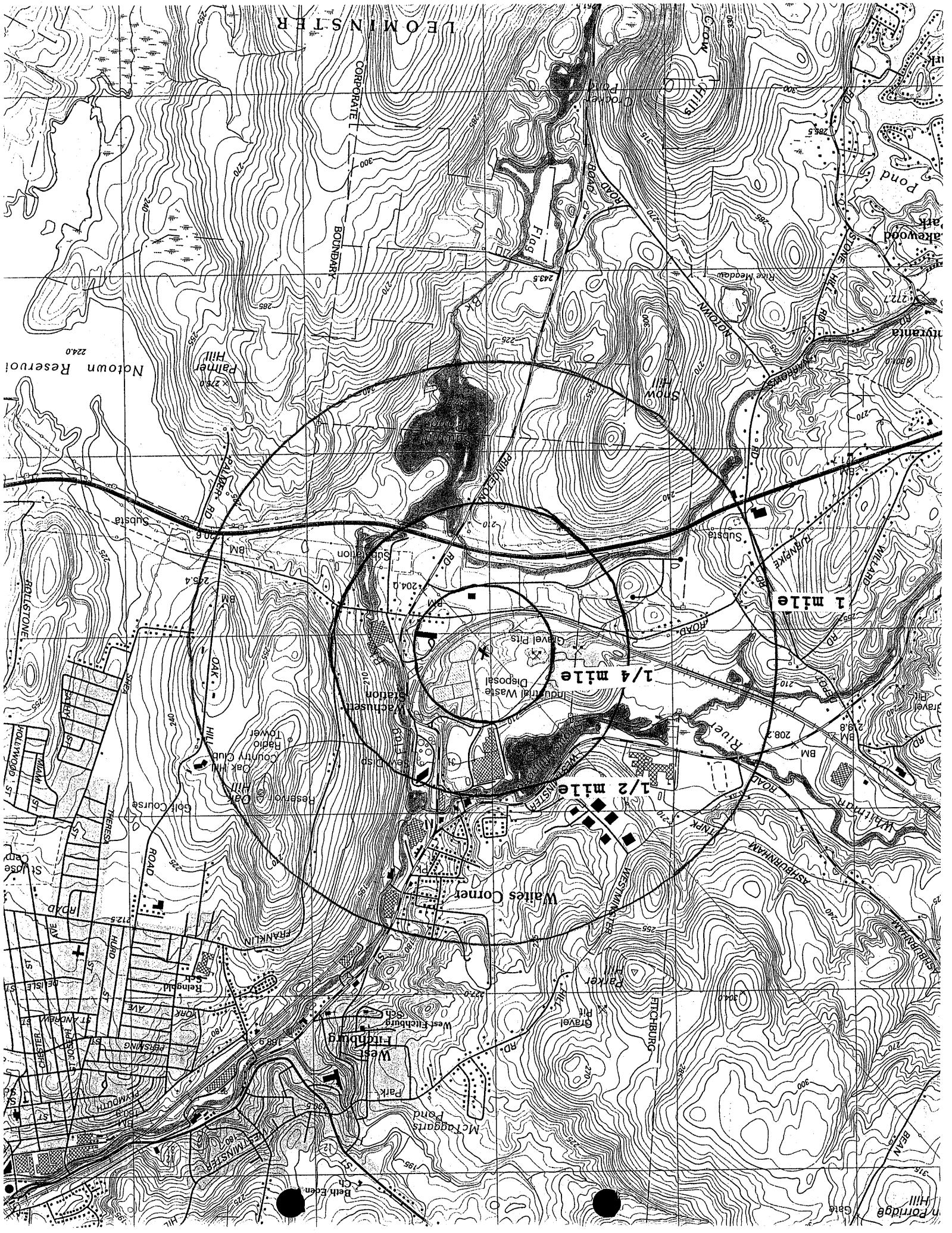
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- U.S. EPA. 1979. "Findings of Violation and Order of Compliance Docket No. 79-739". 3 pgs.
- Shepardson, D. 1985. Lettter from Dave Shepardson fo the Executive Office of Environmental Affairs to Mr. Norman Burt of James River - Massachusetts. 1 pgs.
- Watson, Clint 1984. Memo from Clint Watson, Permits Section to Mr. Paul Hogan, Westboro, DEQE.

MSCA Site Inspection - HRS (SIP) Report
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Figure 1. Location Map - James River Mill No. 8
Fitchburg, Massachusetts



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**Figure 2. Surface Water Pathway and Sampling
Locations Associated with the Former
Sludge Lagoons at James River Mill #8
Fitchburg, MA**

Sampling Results Could not be Interpreted,
Therefore, Results are not Presented.

MA DEP - Bureau of Waste Site Cleanup

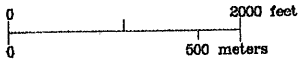
FIGURE 4

Preliminary Assessment Scoring Map: 1, .5 & .25 Mile Radii

SITE NAME:

James River Mill No.
Old Princeton Road
Fitchburg

SCALE 1:20,000



- Medium Yield Aquifers
- High Yield Aquifers
- DEP Approved Zone IIs
- Half-Mile Interim Wellhead Protection Areas
- Lakes, Ponds, Rivers and Streams
- Nonforested Freshwater Wetlands
- Salt Marshes
- State, Federal and Private Protected Open Space
- Area of Critical Environmental Concern (ACEC)
- Solid Waste Facilities - Post 1971
- EPA Designated Sole Source Aquifers

- Major Basins
- Sub-basins
- Municipal Boundaries
- County Boundaries
- Zones of Contribution
- USGS Quad Boundaries
- Interstate Highways
- Numbered Routes
- Secondary Roads



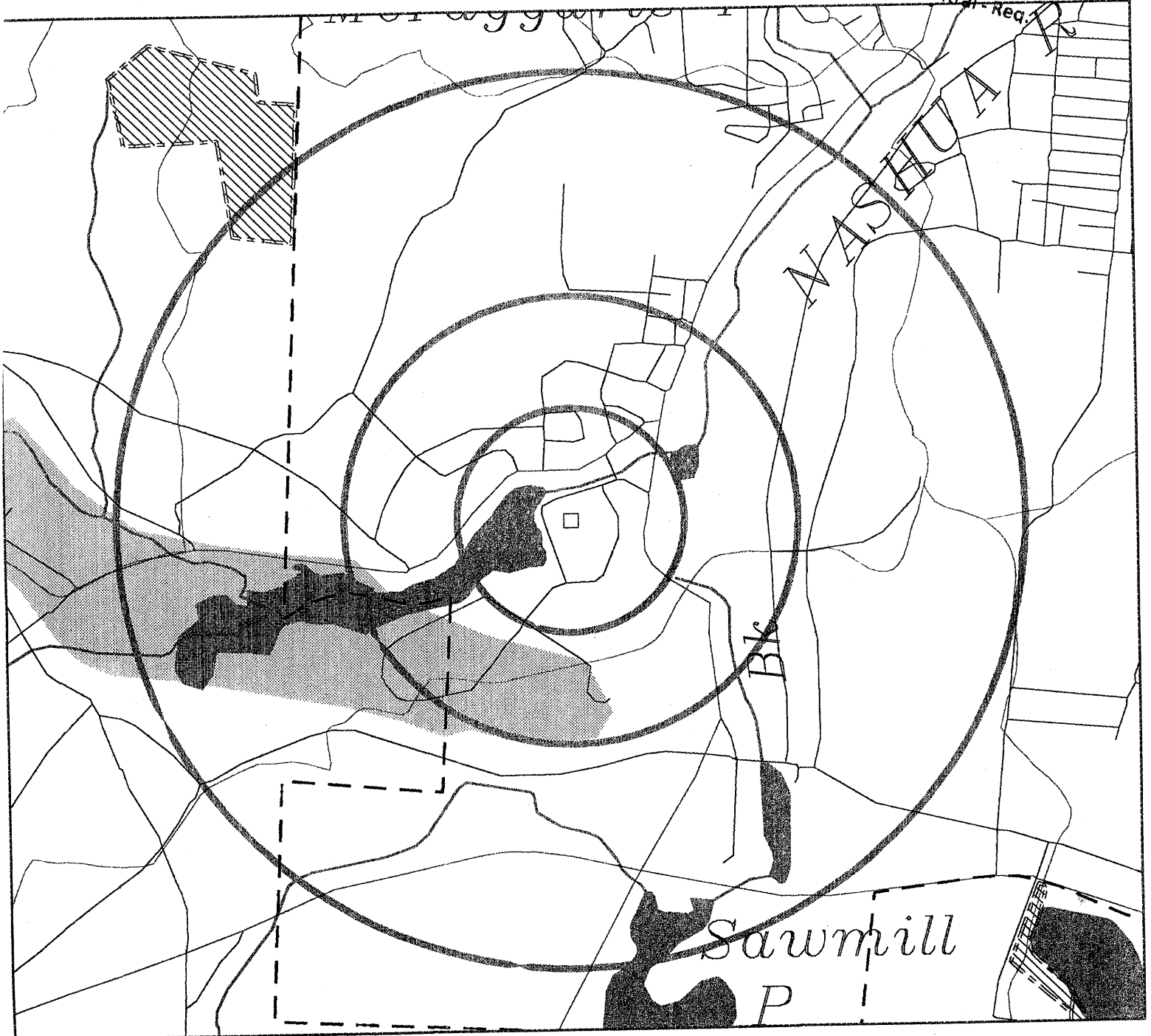
NHESP Estimated Habitats of Rare Wetlands Wildlife
1992, for use with Wetlands Protection Act ONLY

- Community Public Water Supplies - Groundwater
- Community Public Water Supplies - Surface Water
- NHESP Certified Vernal Pools, 1992

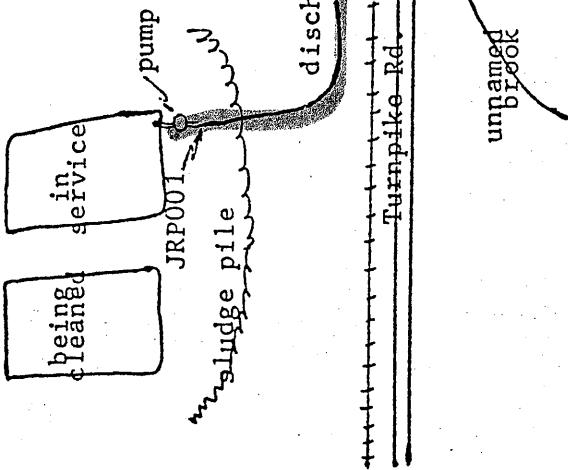
RECEIVED

DEC 07 1992

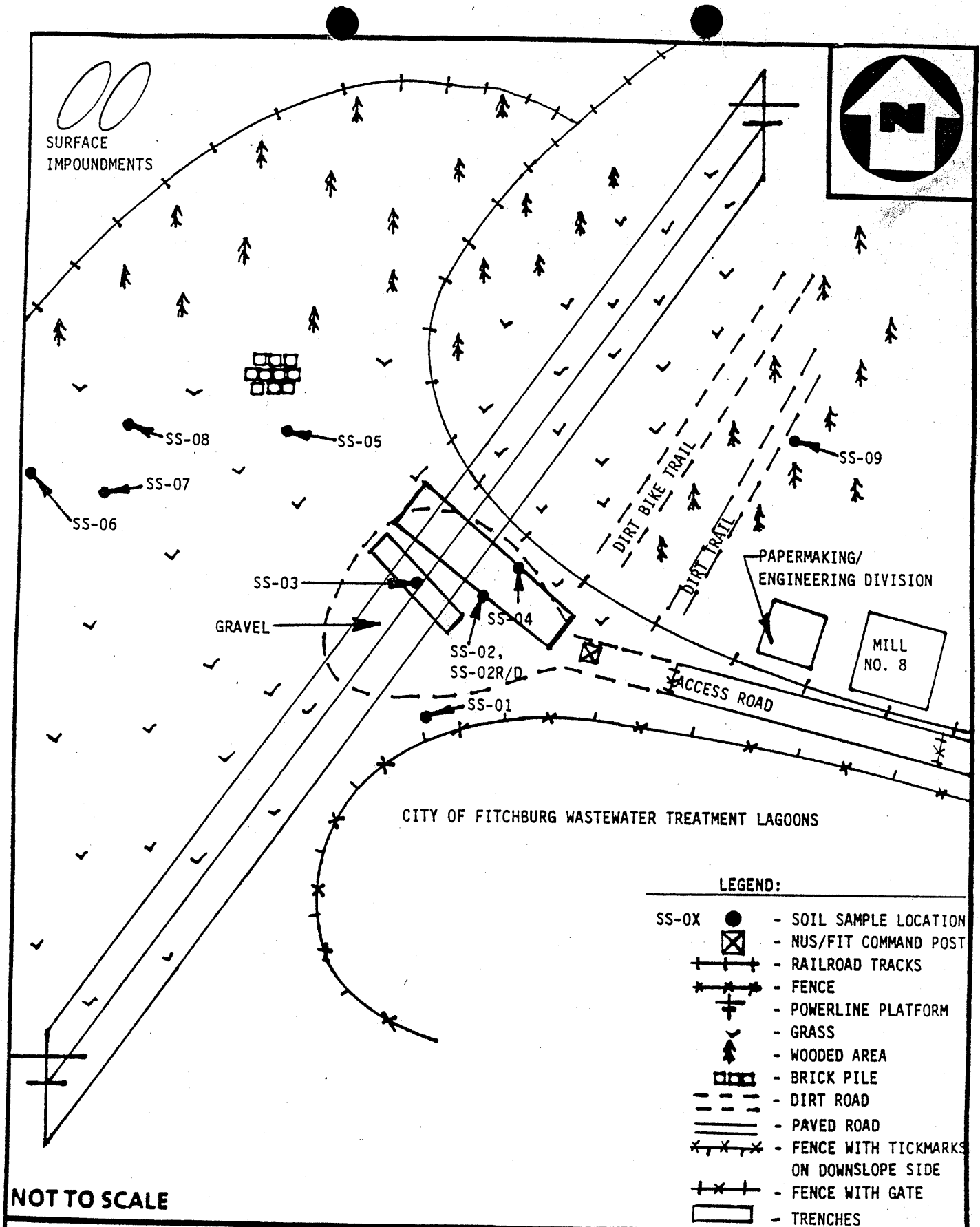
DEP
Central-Reg.



James River Paper Sludge Ponds



SAMPLING LOCATIONS FOR
JAMES RIVER PAPER CO. DISCHARGE
NOVEMBER 14, 1978



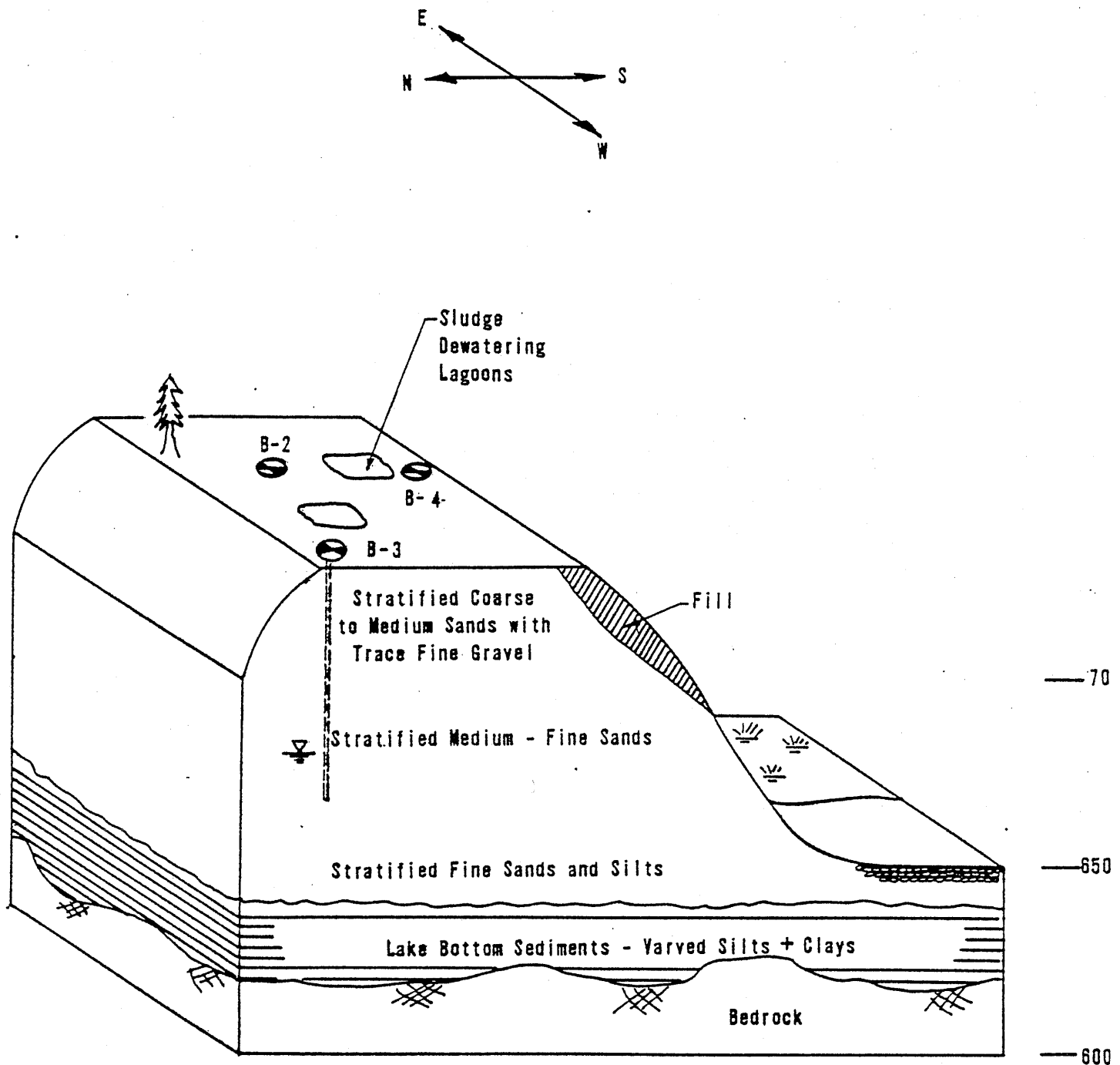
SITE SKETCH

JAMES RIVER INC. MILL NO. 8
FITCHBURG, MASSACHUSETTS



FIGURE 3

FIGURE 6



GEOLOGIC BLOCK DIAGRAM

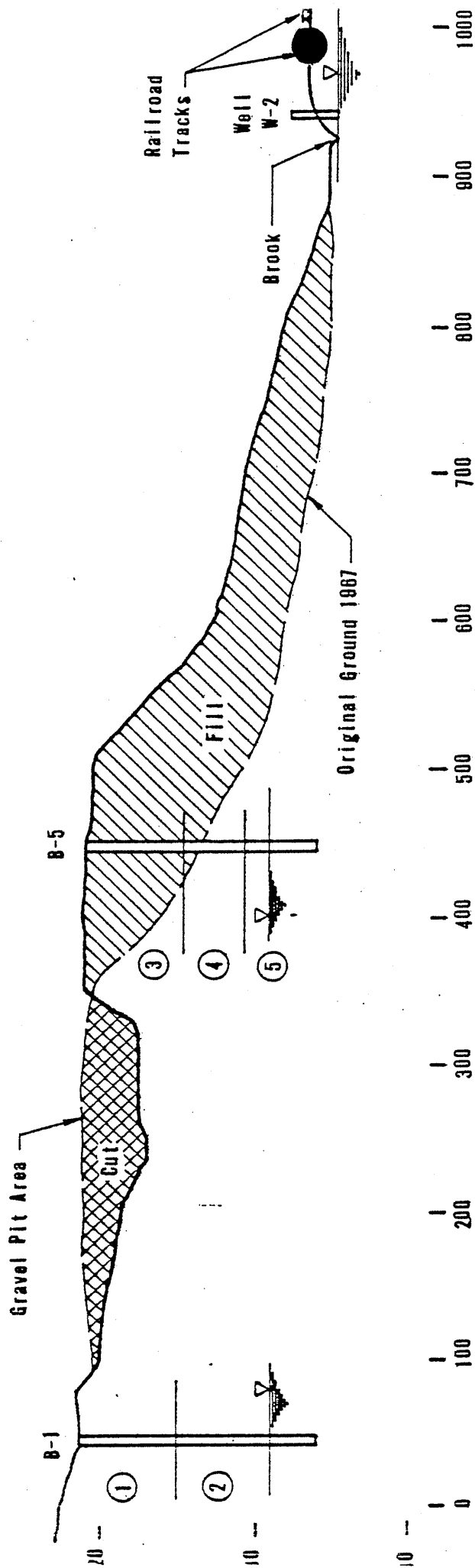
JAMES RIVER MASSACHUSETTS, INC.
SLUDGE DISPOSAL STUDY



MALCOLM PIRNIE, INC.

NORTH

FIGURE 8



SOIL HORIZONS

①

Lt. brown, firm to hard, wet-damp f-med. sand, tr. to little inorganic silt, stratified.

②

Lt. brown, very compact, damp to wet, stratified, f-c sand, few f-med. gravel lenses.

③

Dk. brown-black compact, damp, ash, brick, cinder, wood, glass. Some f-med. sand, some inorganic silt, tr. boulders (fill).

④

Lt. brown, firm to hard, dry, f-med. sand, tr. med. gravel, tr. inorganic silt.

⑤

V. lt. brown, compact to v. compact, damp to wet, vf sand w/ inorganic silt.

GEOLOGICAL SECTION - 2

SCALE: HORIZ. 1" = 100'
VERT. 1" = 40'

JAMES RIVER MASSACHUSETTS, INC.
SLUDGE DISPOSAL STUDY

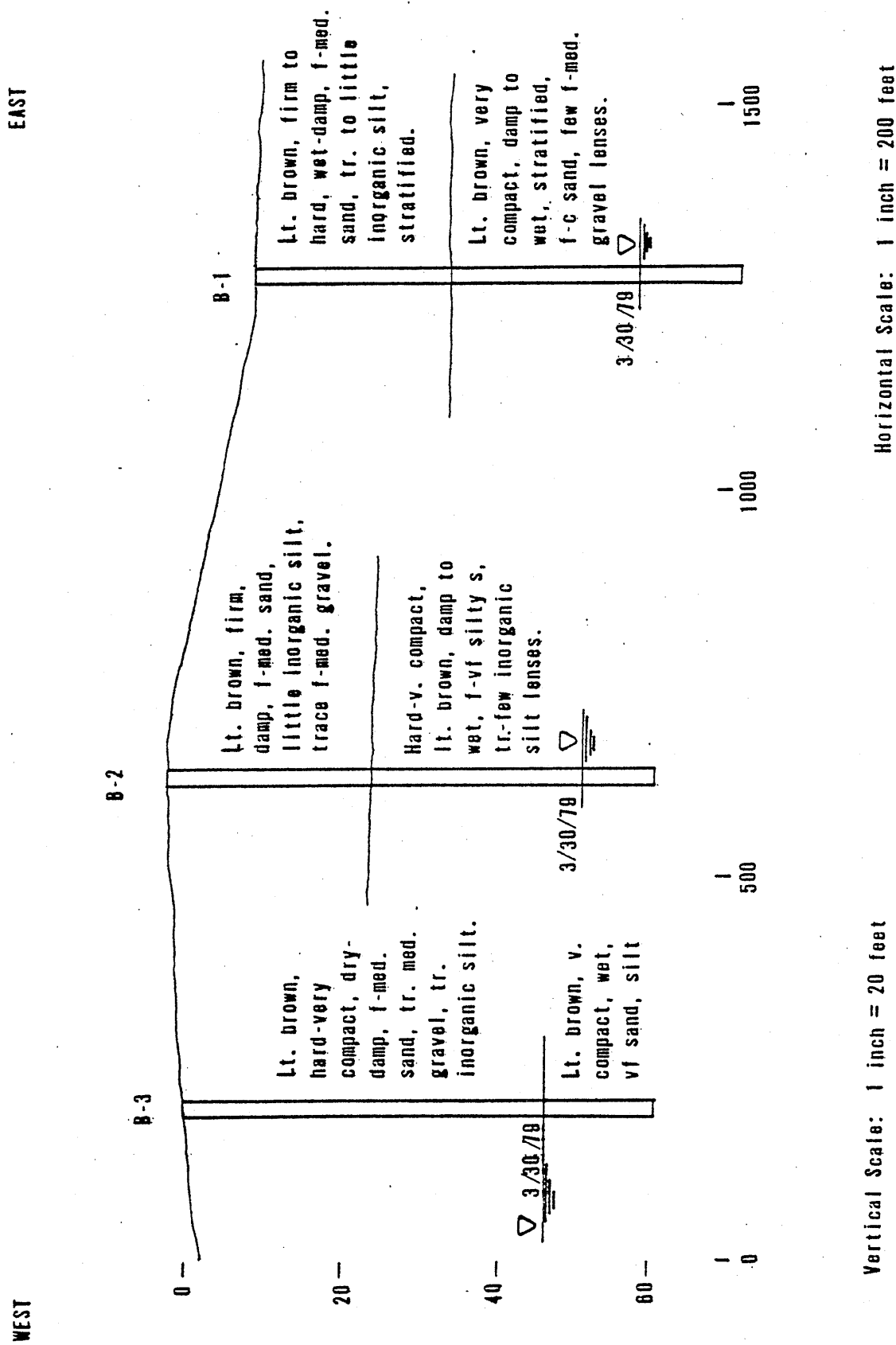


MALCOLM PIRNIE, INC.



GEOLOGICAL SECTION - 3

FIGURE 9



MSCA Site Inspection - HRS (SIP) Report
James River Inc. Mill No. 8
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Figure 2A. Probable Surface Water Pathway of
the Waste Water Relative to the Flood Zones
from James River Mill #8, Fitchburg, MA.

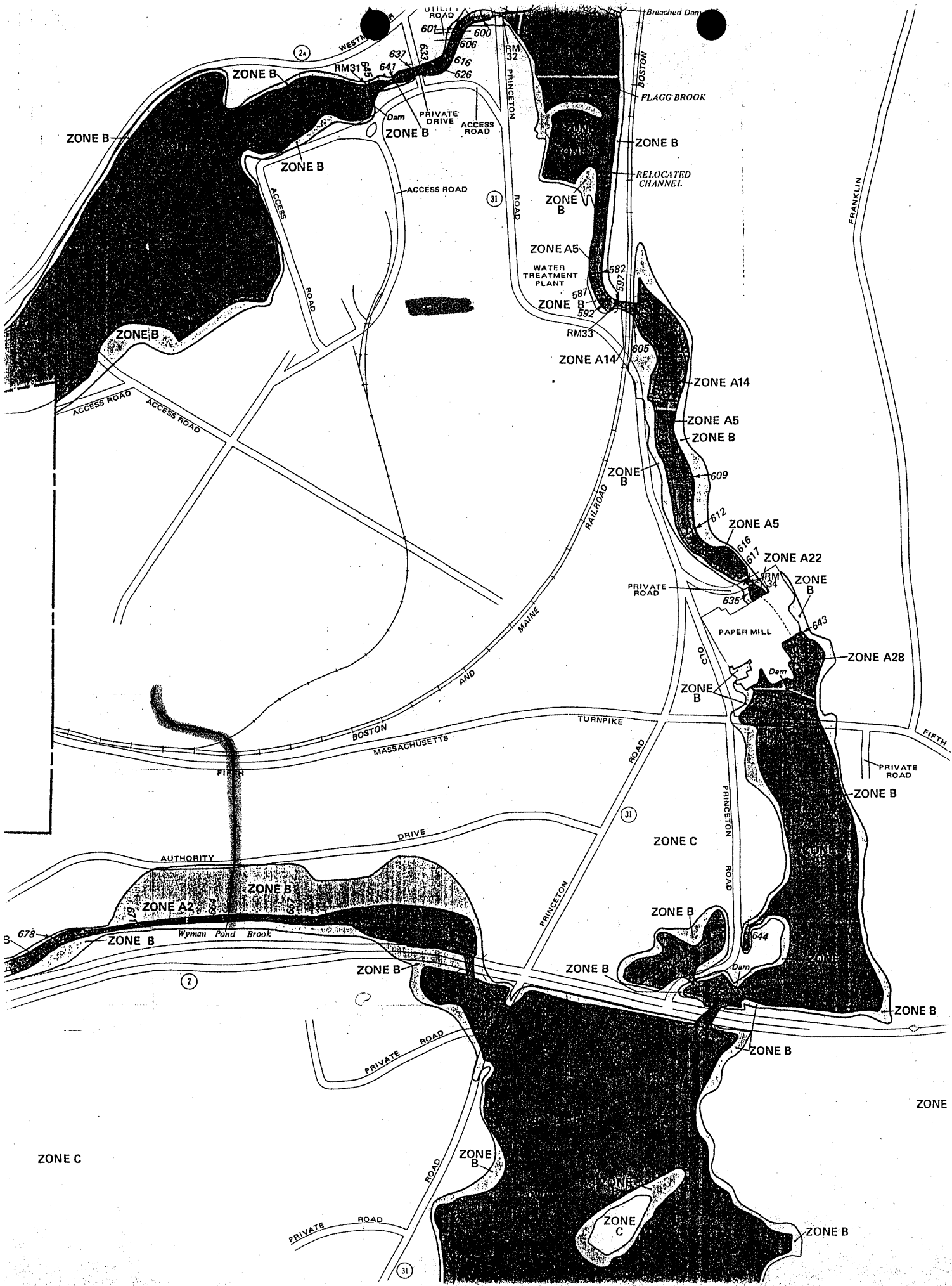


TABLE 1. WELL SAMPLING DATA FROM FIVE MONITORING WELLS NEAR THE
SLUDGE LAGOONS AT JAMES RIVER MILL # 8 IN FITCHBURG,
MASSACHUSETTS (All Results in Parts Per Billion)

Well #1 Sample Parameters										
Date	pH	Fe	THF	DMF	Ba	Cd	Cr(tot)	Cu	Pb	Zn
4/27/82	5.4	4600	11	<1000						
6/2/82	5.6	--	<1	<1000						
9/17/82	6.8	5500	54	<1000						
12/15/82	-	7600	<100	<1000						
5/13/83	-	600	<100	<1000						
8/2/83	-	5600	24	ND						
11/22/83		13000	ND	ND						
5/18/84		11000	<10	<1000						
5/18/84		480	10	1000	20	5.8	<.5	39	19	40
10/4/84	5.0	10000				2.7	18	32	28	
4/19/85	4.6	43000				1.9	32	55	47	
11/21/85		DRY								
	1,1-DI	1,1-DCE	1,2-DI	1,1,1-TCE	TRI	TETRA	T	X	EB	
12/12/80	1-9	1-9	17	520	28	54	ND	ND	ND	
1/20/81	ND	ND	ND	150	ND	ND	ND	ND	ND	
5/26/81	ND	58	84	450	47	85	ND	ND	ND	
4/27/82	ND	39	42	180	21	39	ND	ND	ND	
5/6/82	ND	60	77	120	18	37	ND	ND	ND	
5/13/82	ND	ND	ND	1-9	ND	ND	ND	ND	ND	
6/2/82	38	ND	34	140	13	28	ND	ND	ND	

[illegible]

TABLE 1 (continued)

MONITORING WELL # 5

Date	pH	Fe	THF	DMF	Ba	Cd	Cr(tot)	Cu	Pb	Zn
4/27/82	5.7	23000	390	<1000						
6/2/82	6.0		24	<1000						
9/17/82	6.7	16700	140	<1000						
12/15/82		24000	10	<1000						
5/13/83		240000	100	<1000						
8/2/83		156800	9	ND						
11/22/83		170000	ND	ND						
5/18/84		260000	30	<1000						
5/18/84		270000	10	<1000	<20	.98	<.5	<5	9.8	21
9/28/84	6.3									
10/4/84		260000				1.2	<5	8	15	
4/19/85		270000				1.0	10	10	14	
11/21/85		580000				2.9	13	39	40	

DATE	1,1-DI	1,1-DCE	1,2-DI	1,1,1-TCE	TRI	TETRA	T	X	EB
12/12/80	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/21/81	ND	1-9	1-9	24	1-9	26	ND	ND	ND
4/27/82	ND	ND	ND	15	ND	1-9	ND	ND	ND
5/6/82	ND	ND	12	11	1-9	12	ND	ND	ND
5/13/82	ND	ND	ND	1-9	ND	1-9	ND	ND	ND

TABLE 2. ANALYTICAL DATA OF SURFACE WATER SAMPLES
FROM A STREAM EXITING THE FORMER SLUDGE LAGOONS
AT THE FORMER JAMES RIVER MILL # 8 IN FITCHBURG, MA

All Sample Results are in Parts Per Billion

DATE	Test Parameters									
	pH	Fe	THF	DMF						
4/27/82	6.1	15700	<1	<1000						
9/17/82	7.4	45000	<10	<1000						
12/15/82		45000	<10	<1000						
5/13/83		27000	<10	<1000						
8/2/83		15600	ND	ND						
11/22/83		14000	ND	ND						
5/18/84		51000	<10	<1000						
					Ba	Cd	Cr	Cu	Pb	Zn
5/18/84		12500	<10	<1000	86	<.5	<.5	7.6	5	10
4/19/85	6.1	6300	<1	<10				<10	<10	
11/21/85	6.8	8000	<.5	<5				<5	<5	

DATE	1,1-DI	1,1-DCE	1,2-DI	1,1,1-TCE	TRI	TETRA	T	X	EB
12/12/80	ND	ND	ND	21	ND	ND	26	ND	ND
3/4/81	ND	1-9	ND	50	ND	ND	450	590	770
4/7/81	ND	ND	ND	24	ND	ND	14	24	ND
5/26/81	14	1-9	ND	26	ND	ND	ND	ND	ND
6/23/81	1-9	1-9	ND	17	ND	ND	ND	ND	ND

TABLE 2 (continued)

7/21/81	ND	1-9	ND	1-9	ND	ND	ND	ND	ND
4/27/82	ND	ND	ND	12	ND	ND	1-9	ND	1-9
5/6/82	ND	ND	ND	1-9	ND	ND	1-9	ND	1-9
5/13/82	ND	ND	ND	1-9	ND	ND	ND	ND	ND
6/2/82	ND	ND	1-9	29	1-9	13	ND	ND	ND

ABBREVIATIONS AND MOBILITY CLASS

THF - Tetrahydrofuran	Miscible
DMF - N,N'-dimethylformamide	Miscible
1,1 Di - 1,1-dichloroethylene	No information
1,1 DCE - 1,1-dichloroethane	Very high
1,2-DI - Trans-1,2-dichloroethylene	No information
1,1,1-TCE - 1,1,1-Trichloroethane	Moderate
TRI - Trichloroethylene	No Information
Tetra - Tetrachloroethylene	Moderate
Toluene -	Moderate
Xylene -	Low
Ethylbenzene-	Low

TABLE 3. SEEPAGE AND SURFACE WATER ANALYSES
JAMES RIVER, MASS.
FITCHBURG, MA.
January 15, 1979 - May 21, 1979
mg/l

Parameter	1/15	2/14	3/12	4/6	4/26	5/1	5/21
Cadmium	<.002	.03	<.002				
Chromium	<.01	<.01	<.01				
Copper	.01	.01	.01				
Zinc	.02	<.005	<.005				
Arsenic	<.5	<.5	<.5				
Barium		<.1	<.1				
Lead	<.1	<.1	<.1				
Mercury	.0001		<.0001				
Selenium	<.5	<.5	<.5				
TMF				ND	ND	ND	ND
DMF				ND	ND	ND	ND

THF - Tetrahydrofuran
DMF - N,N-dimethylformamide

TABLE 4

GROUNDWATER ANALYSIS FROM THE SLUDGE LAGOONS AT
JAMES RIVER, MA.
FITCHBURG, MA.

Date	THF (ppb)	DMF (ppb)	Comments
Well B-1			
4/26	12600	29000	
5/21	2200	ND	
Well B-3			
4/6	-	-	
5/21	2500	ND	
Well B-4			
4/6	Present	Present	
4/26	123900	198300	
5/7	43800	215200	before flush
5/8	14600	85200	before flush
5/14	1400	ND	right after flush
5/21	1200	ND	1 wk after flush
Well B-5			
4/26	44800	84500	
5/21	25500	53300	
Well W-1 (installed downgradient)			
4/26	ND	ND	
5/21	ND	ND	
Well W-2 (installed downgradient)			
4/6	-	-	
4/26	-	-	
5/21	ND	ND	

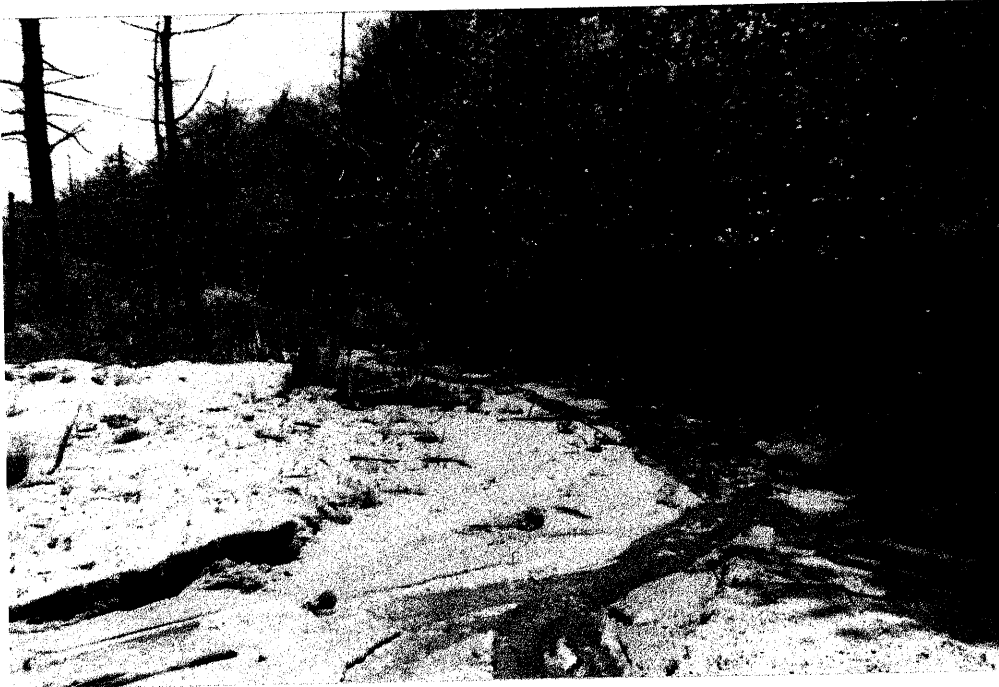
ND - Non-detected

- - Symbol use unknown

THF - Tetrahydrofuran; detection limit was 1000 ppb

DMF - N,N-dimethylformamide; detection limit is 25000 ppb.

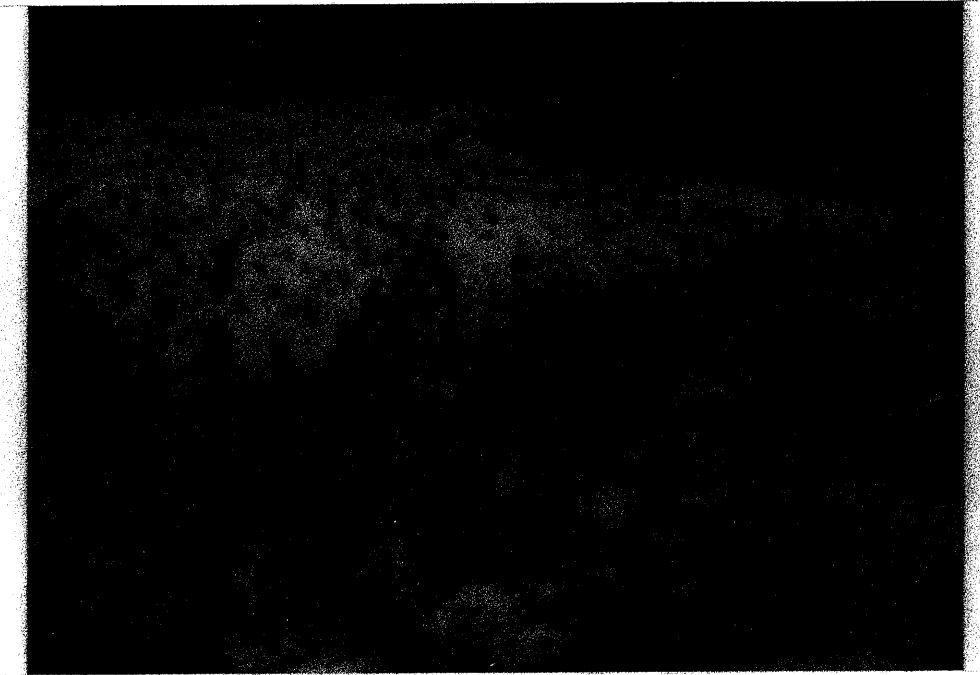
HISTORICAL PHOTOGRAPHS REGARDING THE
SLUDGE LAGOONS AT JAMES RIVER MILL # 8



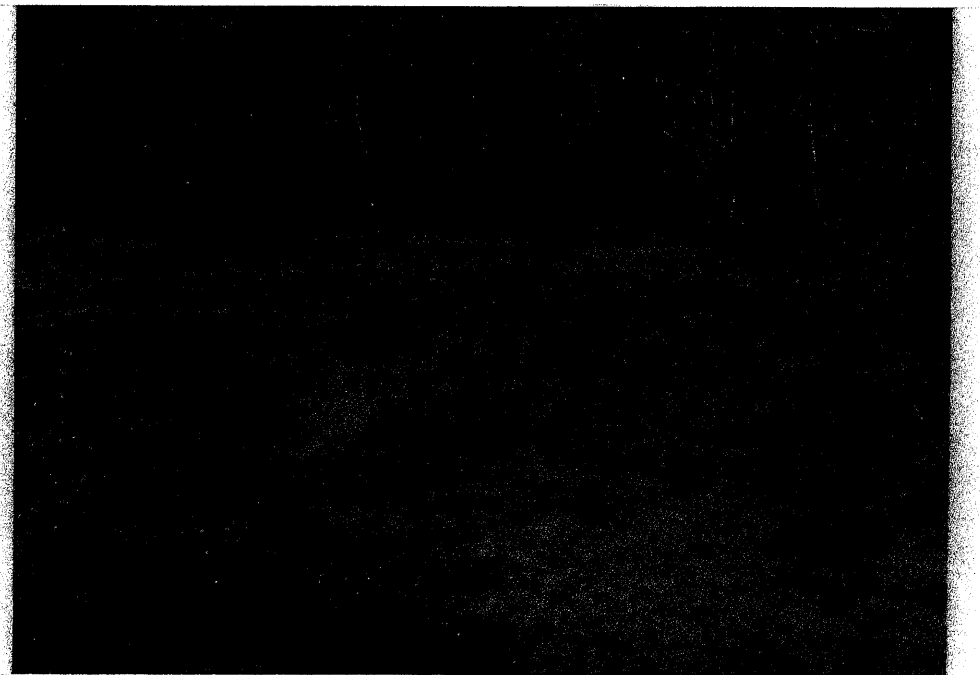
July 1979 - Wetland Below James River Mass., Co.
Lagoons



July 1979. Extensive Filing and Siltation of
Wetland Below James River Co.



Hillside and Low Area Below James River
Lagoons. Note Only One Kind of Vegetative Cover



James River Mass, Co. Dump Site Run-Off Area.
September 15, 1979



Wetland Area Below Dump Site
September 15, 1979